IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF NEW YORK

MEDGRAPH, INC., Plaintiff, v. MEDTRONIC, INC. Defendant.	CASE NO. JURY TRIAL DEMANDED

COMPLAINT

Plaintiff Medgraph, Inc. ("MGI" or "Plaintiff"), for its complaint against defendant Medtronic, Inc. ("Medtronic" or "Defendant"), alleges as follows:

The Parties

1. MGI is a corporation organized and existing under the laws of the State of New York, with a place of business at 53 Glenside Way, Rochester, New York 14612.

2. MGI is in the business of making, selling and distributing methods and systems that include the electronic, telephonic and wireless collection and storage of patient information in the form of critical diagnostic data, including, *inter alia*, that which is useful for the management of diabetes, including the conversion thereof to graphical or other useful form for access by and electronic delivery to medical professionals.

3. Upon information and belief, Medtronic is a Minnesota corporation, with a place of business at 710 Medtronic Parkway, Minneapolis, MN 55432-5604. Defendant is in the business, *inter alia*, of manufacturing, offering for sale and selling a broad range of medical equipment and technology, diagnostic equipment and systems for use in healthcare management, including that of diabetes care.

4. Upon information and belief, Medtronic does business within the State of New York and in this judicial district on a continuous and systematic basis, including without limitation, by offering for sale or use, and or selling, distributing or promoting for use by others, a diabetes management system (the "Carelink System" for blood glucose monitoring) and equipment for use therein, including blood glucose meters and software for uploading patient data, all of which are designed to measure, collect and store critical patient diagnostic data, and to convert the same to graphical or other usable form for access by and internet delivery to medical professionals upon their request.

Jurisdiction

5. This is an action for patent infringement arising under the patent laws of the United States, United States Code, Title 35, §§ 1 *et seq.*

6. This Court has subject matter jurisdiction of the action under Title 28, United States Code, §§ 1331 and 1338(a).

7. Upon information and belief, venue in this judicial district is proper under Title 28, United States Code, §§ 1391(b) and 1400(b).

Facts

8. United States Patent No. 5,974,124 ("the '124 Patent"), entitled "Method and System Aiding Medical Diagnosis and Treatment" (**Ex. A**), was duly and legally issued by the United States Patent and Trademark Office on October 26, 1999.

9. MGI is the owner of all right, title and interest in and to the '124 Patent, including, without limitation, the right to sue and to recover for past and future infringement thereof.

10. Medtronic, through its Carelink Therapy Management software, including Carelink Personal and Carelink Pro software, and its Carelink Database, has for some time, and

continuing to the present time, sold, offered for sale or use, distributed and/or provided for use by others, a diabetes management system (the "Carelink System" for blood glucose monitoring) that is designed to measure, collect and store patient medical data, and to convert the same to graphical or other usable form for access by and Internet delivery to medical professionals upon request, without license or authorization from MGI.

Count One – Infringement of U. S. Patent No. 5,974,124

11. Plaintiff incorporates by reference herein the allegations set forth in paragraphs 1-10 herein.

12. Defendant has infringed, and is continuing to infringe, one or more claims of the '124 Patent by offering for sale or use, and/or selling, distributing, or providing for use by others at least the Carelink System and associated equipment for blood glucose monitoring in combination with a web based server system.

13. Defendant's infringement of the '124 Patent has been deliberate, willful and with full knowledge of the '124 Patent.

14. Plaintiff has suffered damages by reason of Defendant's willful infringement of the '124 Patent, and will suffer additional damages and will be irreparably injured unless the Court enjoins Defendant from continuing such infringement.

Count Two – Inducement of Infringement of U. S. Patent No. 5,974,124

15. Plaintiff incorporates by reference herein the allegations set forth in paragraphs 1-14 herein.

16. Defendant has induced infringement and is continuing to induce infringement, of one or more claims of the '124 Patent by offering for sale or use, and/or selling, distributing,

promoting or providing for use by others at least the Carelink System and associated equipment for blood glucose monitoring in combination with a web based server system.

17. Upon information and belief, Defendant's inducement of infringement of the '124 Patent has been deliberate, willful and with full knowledge of the '124 Patent.

18. Plaintiff has suffered damages by reason of Defendant's willful inducement of infringement of the '124 Patent, and will suffer additional damages and will be irreparably injured unless the Court enjoins Defendant from continuing such inducement of infringement.

Count Three – Contributory Infringement of U. S. Patent No. 5,974,124

19. Plaintiff incorporates by reference herein the allegations set forth in paragraphs 1-18 herein.

20. Defendant has contributed to the infringement of the '124 Patent and is continuing to contribute to the infringement of one or more claims of the '124 Patent by offering for sale or use, and/or selling, distributing, or providing for use by others at least the Carelink System and associated equipment for blood glucose monitoring in combination with a web based server system.

21. Plaintiff has suffered damages by reason of Defendant's willful contributory infringement of the '124 Patent, and will suffer additional damages and will be irreparably injured unless the Court enjoins Defendant from continuing such contributory infringement.

Prayer for Relief

Wherefore, Plaintiff requests a judgment as follows:

A. That Plaintiff is the owner of all right, title and interest in and to United States Patent No. 5,974,124, together with all rights of recovery under such patent for past and future infringement thereof;

B. That United States Patent No. 5,974,124 is valid and enforceable in law and that Defendant has infringed the patent;

C. Awarding to Plaintiff its damages caused by Defendant's infringement of United States Patent No. 5,974,124, including an assessment of pre-judgment and post-judgment interest and costs;

D. That Defendant's infringement has been willful and said damages be trebled pursuant to 35 U.S.C. § 284;

E. Entering a preliminary and permanent injunction against Defendant, its officers, employees, attorneys, all parent and subsidiary corporations and affiliates, their assigns and successors in interest, and those persons in active concert or participation with any of them who receive notice of the injunction, enjoining them from continuing acts of infringement of United States Patent No. 5,974,124, including without limitation, from continuing to make, use, sell and/or offer for sale at least the Carelink System for blood glucose monitoring;

F. That this is an exceptional case and awarding to Plaintiff its costs, expenses and reasonable attorney fees pursuant to 35 U.S.C. § 285; and

G. Awarding to Plaintiff such other and further relief as the Court may deem just and proper.

Jury Demand

In accordance with Fed. R. Civ. P. 38(b), Plaintiff hereby demands a trial by jury for all issues triable by jury.

December 2, 2009

Respectfully submitted,

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EXHIBIT A

US005974124A

United States Patent [19]

Schlueter, Jr. et al.

[11] **Patent Number:** **5,974,124**

[45] **Date of Patent:** **Oct. 26, 1999**

[54] **METHOD AND SYSTEM AIDING MEDICAL DIAGNOSIS AND TREATMENT**

[75] Inventors: **Edward L. Schlueter, Jr.**, Rochester; **Paul DeSarra**, Fairport, both of N.Y.

[73] Assignee: **Med Graph**, Rochester, N.Y.

[21] Appl. No.: **08/785,382**

[22] Filed: **Jan. 21, 1997**

[51] **Int. Cl.**^{6} **H04M 11/00**

[52] **U.S. Cl.** **379/106.02**; 709/203; 600/301

[58] **Field of Search** 705/2, 3; 600/300, 600/301; 379/88.01, 88.24, 106.02; 709/203

[56] **References Cited**

U.S. PATENT DOCUMENTS

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5,692,073	11/1997	Cass	382/219
5,704,364	1/1998	Saltzstein et al.	600/300

Primary Examiner—Zarni Maung
Assistant Examiner—David M Ovedovitz
Attorney, Agent, or Firm—Leonard Heyman

[57] **ABSTRACT**

A method and system that assists medical practitioners who treat or prescribe treatment of patients having a medical condition which requires long-term profiling of medical data taken from the patient's body. Medical practitioners, their assistants, and patients take medical readings of predetermined medically important variables. These readings are stored as raw data in a data receptacle such as a smart card or in a portable medical instrument, then input into a remote computer, or the raw data is manually entered into a remote computer. The remote computer then connects with a primary computer using a communications connection and transmits the raw data to the primary computer system which maintains a database of patients and their medical readings. The communications connection can be any means of connecting two computers for communication therebetween but is preferably an Internet connection wherein the remote computer is operated as a web client and the primary computer is operated as a web server. The readings can also be transmitted to the primary computer using an ordinary telephone to call a telephone peripheral which can receive the raw data using automated speech recognition or touch-tone recognition. Requests for data by medical practitioners is transmitted to the primary computer in a manner similar to the transmission of raw data. In response to a request for data, output, in the form of a chart or graph, or multiple charts and graphs, is transmitted to the remote computer for display on the computer screen and/or printed for hard copy, or faxed to the medical practitioner or assistant.

16 Claims, 3 Drawing Sheets

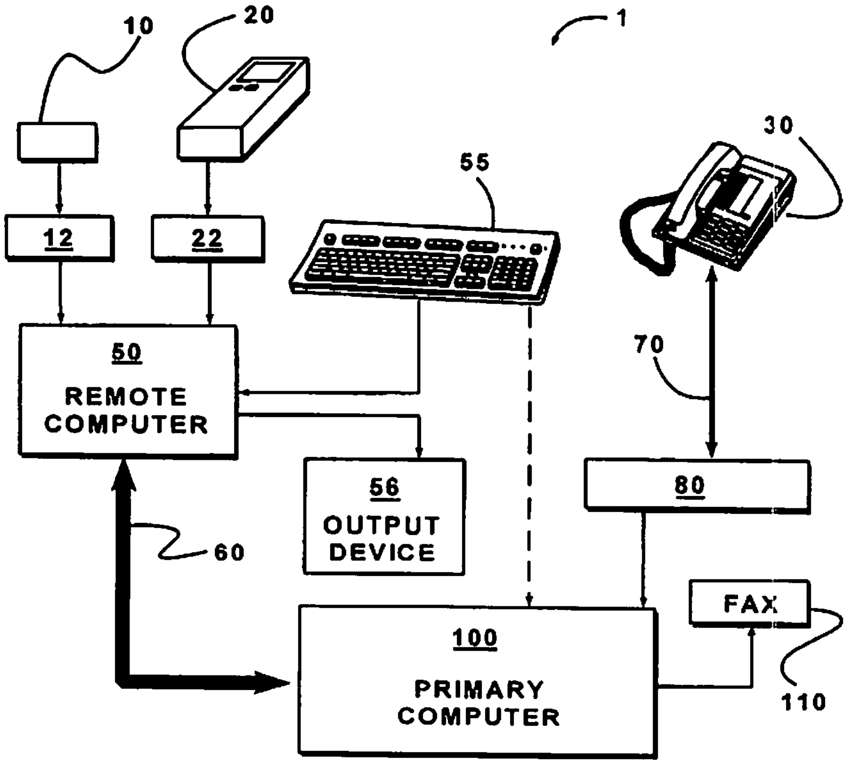
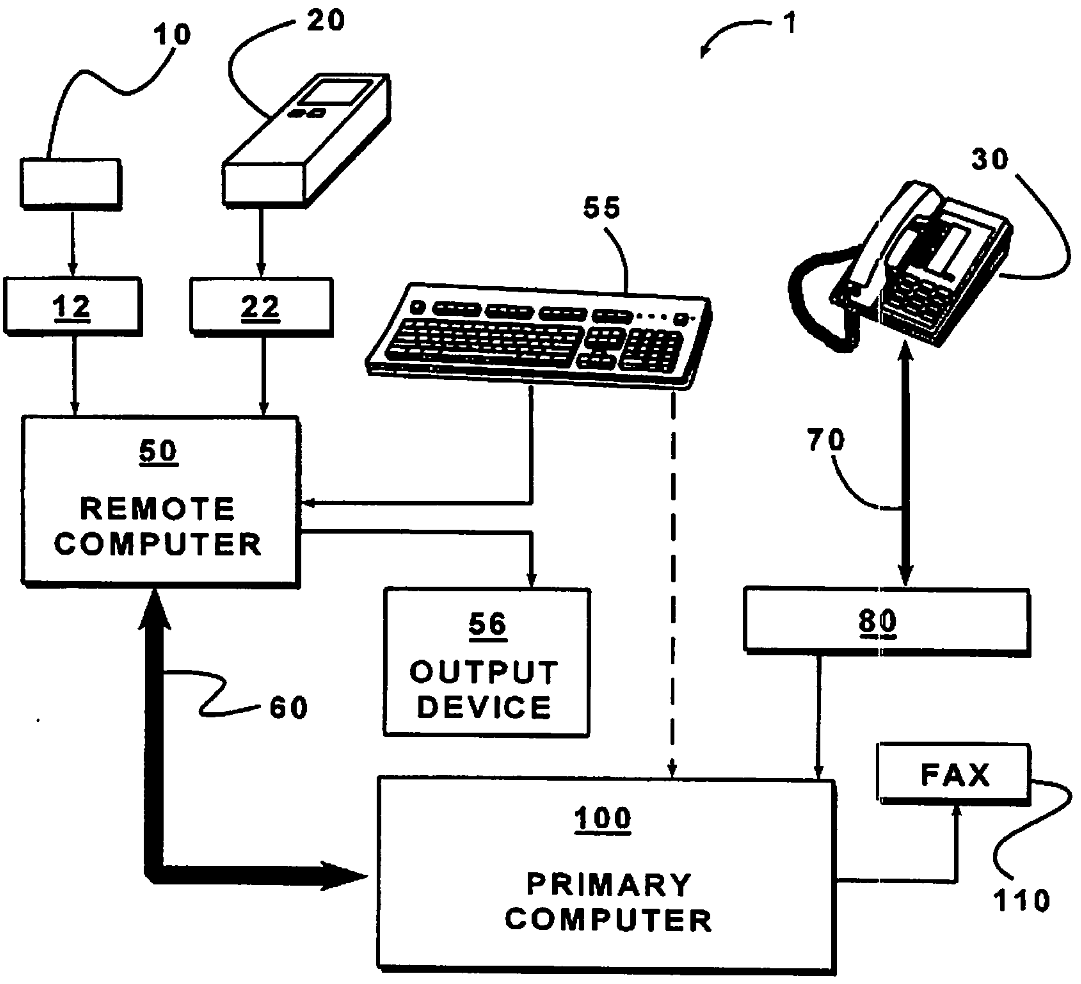


FIG. 1



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REMOTE COMPUTER
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OUTPUT DEVICE
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FAX
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PRIMARY COMPUTER
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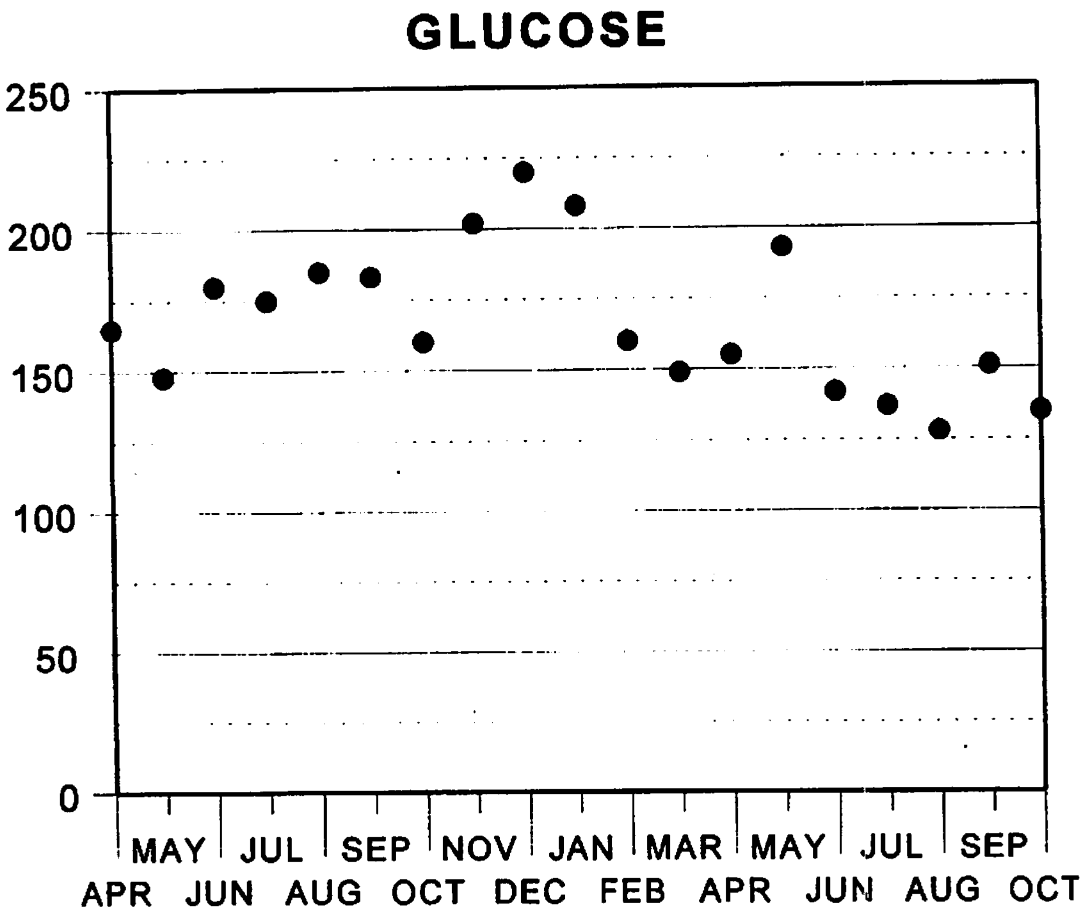
DATE	DAY	7am	10am	1pm	3pm	5pm	7pm	10pm
8/17		133					79	
8/18		119					211	106
8/19		110				85		101
8/20		157				125		189
8/21		143					115	143
8/22		126				120		152
8/23		134				219		258
8/24		184				207		180
8/25		147				148		304
8/26		119				113		227
8/27		156					267	182
8/28		145					126	125
8/29		158				173		203
8/30		135					160	227

FIG. 2

FIG. 3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METHOD AND SYSTEM AIDING MEDICAL DIAGNOSIS AND TREATMENT

BACKGROUND

Medical symptoms of many types of conditions can be difficult to detect by medical professionals if they occur over an extended period of time. Currently, medical diagnostics such as blood pressure readings and glucose readings are taken at doctors' offices or blood laboratories. The readings are then collected manually and depend on the patient's state of health at that particular time. In some cases, individuals take home readings to assist doctors to better determine medication identification and levels. This data depends on the patient's proficiency and accuracy at taking readings, and is hard for the physician to analyze and is normally communicated only at a doctor's visit. Typically, the patient is diagnosed and medicated based on a minimum amount of data and analysis, which furthermore is not presented to the doctor in a format that facilitates diagnosis. Each reading is presented by a lab report on a separate page, or by an individual manually listing out his own readings with the date and time that these readings are taken—often in irregular intervals.

Diagnosis of many types of medical conditions, such as hypertension, hypoglycemia, obesity, diabetes mellitus, or any disease or condition that requires long-term profiling of one or more variables such as pulse rate, blood pressure, percent body fat, glucose level, cholesterol level, white blood cell count, T-cell count, etc. to effectively diagnose and treat can be markedly improved by a system to consolidate the data and present the data in a format which facilitates such diagnosis.

For the purpose of illustration, consider the condition known as diabetes mellitus, which is a common form a diabetes characterized by inadequate secretion or utilization of insulin, a hormone that regulates blood-sugar levels in the body. According to research done by the Centers for Disease Control and Prevention, in 1989 there was approximately 6.7 million individuals who reported having diabetes mellitus, and it was estimated that an equal number had the condition, but were unaware of it. Diabetes mellitus results in excessive urine production, thirst, hunger, and loss of weight, and can be very disruptive of a person's life. This condition is treatable, but proper treatment depends on accurate long-term profiles of a patient's blood sugar levels. In addition, people who suffer from diabetes mellitus are also at increased risk for heart disease, and should monitor their heart rate and blood pressure at regular intervals. Doctors working with diabetes patients must inspect a great deal of data associated with tracking the disease. Diabetes patients often measure the blood sugar level two, three, four, or five times a day. Patients typically will take their own blood-sugar level readings using a hand-held medical instrument, and record the readings by writing the results on a chart, which is presented to the medical practitioner during a scheduled appointment.

Medical practitioners, who are increasingly working with more patients with fewer time devoted to each patient, simply do not have time to carefully review a stack of hand-written record sheets to determine whether a patient's recent readings are significantly improved in comparison to the patient's previous readings. The present invention addresses this problem by providing accurate records with simple and versatile input and output of the information from a centralized data base. Trends are easily spotted, as are erratic or cyclic readings. Thus, diagnosis and treatment of a disease such as diabetes mellitus becomes quicker and more accurate for improved results.

SUMMARY

The purpose present invention is to target individuals who potentially have a medical condition such as diabetes mellitus and are unaware of it, and to improve diagnosis and treatment by making it more accurate and to assist medical practitioners in determining the proper amount of medication or other treatment to prescribe. The term medical practitioner is intended to include any individual who treats, or prescribes treatment to another individual to improve the latter's health or well-being. The focus of this invention is to gather, organize, and present data which is collected over a long period of time in a way that best facilitates accurate diagnosis and proper treatment of such medical conditions which require long-term profiling of medical readings.

In order to accomplish this goal, data must be gathered, stored, and available to the medical practitioner at their convenience. Medical data is gathered in a variety of ways. Medical practitioners, their assistants, laboratories, and patients themselves are often involved in taking medical readings of such things as blood pressure, pulse rate, weight, and blood-sugar level. Of course, the invention can accommodate any medically important variable. Once the data is gathered, it must be added to a database for storage, such that it is available for use when required by a medical practitioner.

Medical readings taken in the medical practitioners' offices and laboratories are uploaded to a centralized database either via a common network, over telephone lines, or over the Internet. Alternatively, the information could be stored in a network server in a common LAN or fiber optic network if available, e.g. in hospitals and HMOs, which often have their own dedicated computer networks to connect their administrative offices, laboratories, and doctor offices, and on which their patient medical records are stored. In the case of private practices, the Internet could be used, with adequate security precautions taken to prevent unauthorized access to the information, or the information could be uploaded directly to a computer system acting as a database server via modem-to-modem communication over telephone lines.

Patients who take their own readings do so either using their own portable devices or they use equipment set up for their use in drug stores and grocery stores. Examples of such equipment include heart rate and blood pressure reading machines which are commonly found in such places.

Many of the portable medical devices are capable of storing medical readings along with the time and date of the reading. This information can then be downloaded directly into a computer. A medical practitioner or medical assistant can perform this step when the patient visits his medical practitioner.

Medical instruments set up for public use normally display the result. These machines can be modified or replaced with upgraded machines to automatically send the information directly into the database, or into a "smart card" (or other data receptacle) which the patient can present to the medical practitioner upon his visit.

Once a remote computer in the medical practitioner's office contains the most recent data, it must be uploaded to the primary computer system and added to the previously collected data. Once in the primary computer system, the data is processed and made available to the medical practitioner to make diagnoses or establish progress.

The data can also be input directly into the primary computer if the patient agrees to "phone in" his results each time he takes a reading either to a receptionist who manually puts the information into the primary computer system or using a touch-tone phone or a system with voice-recognition software to input the data into the database in the primary computer using an automated system with such capabilities.

If a patient is unwilling or unable to take his own medical readings, a medical practitioner or assistant can visit the patient's residence, take the required readings, and input the data into the primary computer system, either directly or through the use of a remote computer.

Once the information is present in the database, all the medical practitioner needs to do is access the information via a network, telephone, or Internet connection and software capable of presenting processed data in a format that facilitates diagnosis, such as a graph or a chart.

By virtue of the foregoing process, medical practitioners' needs relating to hard-to-identify chronic medical conditions and medical conditions which depend on long-term profiling for proper treatment are effectively met.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 shows a preferred embodiment of the system of the invention.

FIG. 2 shows a portion of an example of a chart that can be useful to medical practitioners in aiding diagnosis and treatment of diabetes mellitus.

FIG. 3 shows an example of a graph that can be useful to medical practitioners in aiding diagnosis and treatment of diabetes mellitus.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The invention, which is discussed below in reference to FIG. 1, consists of a system and method for assisting physicians in accurately diagnosing and treating medical conditions which require long-term profiling of each patient's condition. As a system, the invention comprises computer hardware and software, configured for use as a database capable of storing medical information, especially long-term profiles of medical conditions, of any number of patients, and processing and supplying the information to physicians in a manner which facilitates diagnosis and treatment of conditions from which the patients may suffer.

The computer system 1 includes of data input means, data process and storage means, and data output means. Data input means are adapted for manual or automated data collection from sources including medical offices, laboratories, and patients. Computerized data can be transmitted from these remote locations via telephone lines using direct modem-to-modem communication or by an Internet connection, whereby the database operator will collect data through implementation of a user-friendly graphical user interface over the World Wide Web. Alternatively, individual patients can upload their data on a regular basis by calling a special phone number, and either by operating their touch-tone phone, or using voice recognition software, input the information to the database through a telephone interface. A low-tech substitute for this would be to employ a receptionist to take phone calls and manually input the information into the database. Patients who fail to report their readings at their scheduled intervals can be automatically reminded by phone by calling or paging them using the telephone interface. These methods are described in greater detail below.

There are five main avenues contemplated for inputting data into the primary computer 100. The first avenue is by manually entering data from medical readings into a remote computer 50 using keyboard 55. The remote computer 50 is programmed to then automatically access the primary computer 100 and transmit the data to the primary computer 100 via connection 60. This operation is performed in laboratories and medical practitioners' offices, or by patients who take their own readings and own computers capable of accessing the host computer system 100. Additionally, if a patient is unable to make regular trips to a medical practitioner's office or laboratory, and is unable or unwilling to take their own medical readings, a medical practitioner or assistant can visit the patient's home and collect the data, and manually enter the data into a remote computer system 50 to be transmitted to the primary computer system via connection 60. Connection 60 includes any means of connecting one computer to another for purpose of communication.

If the remote computer and the primary computer are not commonly owned, the connection can be a direct modem-to-modem connection over telephone lines or an Internet connection. If the former connection is used, the primary computer is configured as a dial-up host. In the latter case, the primary computer is operated as a web server on the World Wide Web, and can be accessed through the Internet. The user accesses a web page on the primary computer and enters data in a form which is displayed on the remote computer's screen. The data is then sent to the primary computer, which can then store the information in its database. The primary computer can operate as both a dial-up server and a web server simultaneously.

Connection 60 can also be a direct network connection, which may be desirable if the medical laboratory or medical practitioner's office is located in a larger medical institution which owns and operates the primary computer system.

The second avenue of data input relies on data receptacle 10, which may include any device capable of storing data readable by a computer peripheral 12. It is contemplated that data receptacle 10 could take the form of a "smart card" of a size and shape that would be convenient for the patient to carry in a wallet or purse. Data is encoded in the data receptacle 10 using medical instruments (not shown) equipped for such a task. It is contemplated that heart rate and blood pressure machines commonly found in drug and grocery stores will be so equipped. Once a week, or whenever prescribed, the patient visits the location having such a machine that is convenient to the patient, and the readings are taken by the machine and encoded on the smart card. When the patient visits his medical practitioner, he merely presents the data receptacle 10 which has all the recent readings with associated date and time to the medical practitioner or assistant, who then inputs the data from the data receptacle 10 to the remote computer 50 using data receptacle reader 12 which converts the data into a form usable by the remote computer 50. Data is then transmitted to the primary computer 100 as discussed above with reference to the first avenue.

The third avenue of data input employs portable medical instrument 20. Portable medical instruments 20 are capable of taking readings such as blood pressure or blood sugar level and storing the readings in its own memory and then passing the stored data to a personal computer. In this respect, portable medical instrument 20 is much like data receptacle 10. Data passes to remote computer 50 through interface 22. Data is then transmitted to the primary computer 100 as discussed above with reference to the first and second avenues of data input.

The fourth and fifth avenues of input rely on the individual or third person taking the medical readings and calling the medical readings in to be entered into the data base on the primary computer **100**. In the fourth avenue of data input, this is accomplished by employing a receptionist to take phone calls and manually taking the medical readings over the phone, and manually typing the data using keyboard **55** into the remote computer **50** (or directly into the primary computer **100** if keyboard **55** is connected to the primary computer **100** as represented in FIG. **1** by the dashed lines extending from the keyboard **55** to the primary computer **100**). In the fifth avenue of data input, the individual taking the medical readings phones-in the results using telephone **30** to call primary computer telephone interface **80** via telephone lines **70**. The telephone interface **80** is capable of automatically answering the phone, and prompting for, and accepting the necessary medical information by using a touch-tone phone or by using speech-recognition software, then converting that information into a form usable by the primary computer **100** to which telephone interface **80** is connected.

If the patient is taking his own readings and forgets to call the results in (or forgets to take the readings) the primary computer **100** is capable of calling or paging the patient using telephone interface **80** to remind him.

All five avenues of data input can operate concurrently in a single system which is designed to fill every customer's need, including both patients and medical practitioners. It is also to be understood that any number of remote computers **50** can be configured to access primary computer **100**, and that only one remote computer **50** is shown in FIG. **1** for illustration purposes only. Similarly, the primary computer may have any number of ports for accepting data from remote computers and any number of telephone interfaces for taking phone calls, and it is only for illustration purposes that FIG. **1** shows only one input port (where connection **60** meets primary computer **100**) and only one telephone interface **80**. The system **1** can thus accommodate a large population of patients under a variety of circumstances having a variety of needs and capabilities.

The primary computer **100** is a multi-purpose computer having software and hardware that enable it to receive information from the variety of sources mentioned, a microprocessor to process the data, store the data on a mass storage device integrated with the computer **100**, and present the raw and processed data when required via output means. Its primary purpose is to receive medical readings over long periods of time, store the information as medical histories in a data base application, and present the information to medical practitioners in a form which facilitates accurate diagnosis and treatment of patients' chronic medical conditions.

The received, or raw, data consists of individual readings or measurements of medically-important variables of patients. Obviously, different patients may be measuring different parameters, or variables. One patient might be measuring heart rate and blood pressure, another body weight or body fat, and a third blood sugar, depending on the needs prescribed by the medical practitioner involved. Each reading is combined in a relational data base, or other type of data base, with that patient's previous readings. These readings are then available to the medical practitioner by the output means to be discussed in further detail below. The primary computer will also perform calculations to the data to provide useful statistics to the medical practitioner. For example, data can be averaged on a daily, weekly, bi-weekly, or monthly basis. Morning readings can be averaged together, and evening readings can be averaged together. These averaged can be calculated as needed, then plotted on a graph to facilitate a clear understanding on the part of the medical practitioner of the trends in the data or whether data is erratic or steady.

There are two methods medical practitioners can get useful information from the database on the primary computer **100** to their remote location. The first method is to access a remote computer **50** located, for example, in the medical practitioner's office, which can download information from the primary computer **100** through connection **60**. Again, connection **60** can include a direct network connection, a modem-to-modem connection, or an Internet connection. In the latter case, the remote computer, using software commonly referred to as a "web browser," such as Netscape, Mosaic, or Internet Explorer, can access the primary computer **100**, which would be set up as a "web server." Remote computer **50** is provided with software enabling automatic access, retrieval, and display of the required information at the request of the user—typically the medical practitioner or assistant.

The second method is provided for medical practitioners who do not have personal computers at their disposal which are capable of connecting to the primary computer **100**. In such cases, the medical practitioner or assistant will call, using telephone **30**, telephone interface **80**, and, using either the telephone touch-tone pad or speech recognition, make a request for a medical report on a specific patient. This information is then faxed directly to the medical practitioner's office using fax machine **110**.

As can be seen, FIG. **1**, on the left, shows the "high-tech" utilization of the invention, where the right side of FIG. **1** shows the "low-tech" utilization of the invention. The main distinction between the two systems is that on the high-tech side, the patient or physician using the system requires a computer for data input and output, whereas on the low-tech side, the patient only requires a telephone to call in the readings and the physician only needs a telephone to make a request for data, and a fax machine to receive the chart or graph.

In an example of applying the invention, a patient was diagnosed with diabetes mellitus and is asked by his doctor to take three blood sugar level readings a day: Once in the morning, once before dinner, and once before bed. These readings were taken by the patient and recorded in a primary computer system via a keyboard. A chart was generated, a portion of which is shown as FIG. **2**. The chart shows each reading taken with the approximate time for each reading identified by the column in which the reading appears. This is a common type of chart normally employed by patients who manually record their readings, however the computer is programmed to automatically pick out high and low readings and highlight them by displaying the reading in a colored box, as represented in the drawing by the shaded boxes. High readings are highlighted red, and low readings are highlighted green. The remaining readings are displayed in yellow boxes. These colors are, of course, only exemplary, and any color which distinguishes high and low readings would serve the function. Additionally, rather than placing the readings in discrete boxes, the readings can be placed along a continuum for more accurately visualizing the exact time each reading was taken.

The readings for each month were then averaged together and plotted on a graph shown in FIG. **3**, which plots months beginning in April of 1995 and ending in October of 1996. As can be seen, the glucose level is erratic and generally rises until January of 1996, where corrective action was taken, resulting in a general decline of glucose level in the blood.

As the example shows, the invention enables medical practitioners to quickly and easily spot trends and track the progress of patients they are treating without requiring excessive "extra steps" on the part of medical practitioners employing this invention.

Having substantially described the invention, it is understood that the scope of the invention is limited not by the specification above, but by the appended claims.

We claim:

1. A method for improving and facilitating diagnosis and treatment of patients having medical conditions requiring long-term profiles of specific variables, said method including the steps of

using at least one measuring device, periodically taking a measurement of at least one medically important variable that has been identified for a patient from a body of said patient;

ensuring said patient is separated from said at least one measuring device after taking each said measurement;

inputting said at least one medically important variable as raw data into a primary computer system after said step of ensuring said patient is separated and recording said raw data in a mass storage device integrated with said primary computer system;

compiling said raw data as data for said patient using the primary computer system, said data representing a history of values for said at least one medically important variable for said patient;

receiving a request for data of one of said patients from by a medical practitioner that is treating said one of said patients; and

outputting requested data for said one of said patients in the form of at least one of a chart and a graph to said medical practitioner;

said step of inputting comprising one of

transferring said raw data to a remote computer comprising an ordinary general purpose personal computer, then transferring said raw data to said primary computer;

telephoning an automatic telephone interface and employing one of speech recognition and touch-tone recognition software to input said raw data into said primary computer; and

telephoning a live receptionist, speaking the raw data to said live receptionist for entry into said primary computer.

2. The method of claim 1 wherein the step of inputting includes connecting a remote computer to the primary computer system using a connection that enables communication between said remote computer and said primary computer system, entering said raw data from medical readings into said remote computer, and transmitting said raw data from said remote computer to said primary computer system via said connection.

3. The method of claim 2 wherein said step of inputting said raw data further includes inputting said raw data from a data receptacle into said remote computer.

4. The method of claim 3 wherein said data receptacle is a smart card and said step of inputting said raw data further including the step of storing said raw data on said smart card using medical instruments capable of recording results on said smart card.

5. The method of claim 4 wherein said data receptacle is a portable medical instrument capable of storing medical readings as said raw data, and inputting said raw data into a computer system and said step of inputting further including the steps of taking medical readings using said portable medical instrument, and storing said results in said medical instrument.

6. The method of claim 2 wherein said connection comprises a direct modem-to-modem link using telephone lines, said primary computer system and said remote computer run software enabling automatic handling of said raw data and said step of inputting further includes the steps of automatically calling said primary computer system from said remote computer, answering said call from said primary computer system, linking said remote computer with said primary computer system, and uploading said raw data from said remote computer to said primary computer system, and receiving the raw data into said primary computer system.

7. The method of claim 2 wherein said connection comprises the Internet and said step of inputting further includes accessing the World Wide Web from said remote computer, operating the primary computer as a web server, accessing a form on a web page produced by the primary computer from the remote computer, entering said raw data into said form from said remote computer and transmitting said raw data from said remote computer to said primary computer.

8. The method of claim 1 wherein said step of inputting further comprises calling a telephone interface using an ordinary voice telephone and a telephone network, said telephone interface being connected to said primary computer system, transmitting said raw data from said telephone, receiving said raw data using said telephone interface, and passing said raw data from said telephone interface to said primary computer system.

9. The method of claim 8 wherein said step of transmitting includes speaking the raw data and said step of receiving includes the step of converting said speech into data usable by the primary computer system using automated speech recognition techniques.

10. The method of claim 8 wherein said ordinary telephone includes a touch-tone keypad and said step of transmitting includes operating said touch-tone keypad to enter said raw data into said telephone interface, and said step of receiving includes converting said raw data transmitted using said touch-tone keypad into a form usable by said primary computer system.

11. The method of claim 1 wherein said steps of receiving a request and outputting further include connecting a remote computer to said primary computer system using a connection that enables communication between said remote computer and said primary computer system, entering said request into said remote computer, transmitting said request from said remote computer to said primary computer system, transmitting said requested data from said primary computer to said remote computer in response to said request, said requested data representing said at least one of said chart and graph and interpretable by said remote computer, said remote computer outputting said at least one chart and graph through output means.

12. The method of claim 11 wherein said connection comprises a direct modem-to-modem link using telephone lines, said primary computer system and said remote computer run software enabling automatic handling of said data and said step of transmitting said request includes automatically calling said primary computer system from said remote computer, answering said call from said primary computer system, linking said remote computer with said primary computer system, and automatically transmitting said request for data from said remote computer to said primary computer.

13. The method of claim 11 wherein said connection comprises the Internet and said step of transmitting said request includes accessing the World Wide Web from said

remote computer, operating said primary computer as a web server, accessing a form on a web page produced by said primary computer from the remote computer, entering said request for data into said form from said remote computer and transmitting said request for data from said remote computer to said primary computer, said step of outputting comprising producing an image of said one of a chart and graph in said primary computer and transmitting said image as a web page to said remote computer in response to said request for data being transmitted to said primary computer.

14. The method of claim 1 wherein the steps of receiving a request and outputting include calling a telephone interface using an ordinary voice telephone and a telephone network, transmitting said request for data from said telephone, receiving said request for data using said telephone interface, and passing said request for data to said primary computer system from said telephone interface, said step of outputting includes forming an image of said at least one of a chart and graph and automatically transmitting said image by facsimile machine to said medical practitioner.

15. A method for improving and facilitating diagnosis and treatment of patients having medical conditions requiring long-term profiles of specific variables, said method including the steps of

using at least one measuring device, periodically measuring at least one medically important variable that has been identified for each of said patients from a body of said each of said patients;

ensuring said patient is separated from said at least one measuring device after taking each said measurement;

inputting said at least one medically important variable as raw data into a primary computer after said step of ensuring said patient is separated and recording said at least one medically important variable in a mass storage device integrated with said primary computer system, said step of inputting including one of inputting into a remote computer and transmitting said raw data to said primary computer and inputting said raw data into a telephone interface connected to said primary computer through a telephone and a telephone network, said step of inputting data into a telephone interface includes one of speaking said raw data into said telephone and dialing said raw data into a touch-tone key-pad integrated with said telephone;

compiling said raw data as data for each patient using the primary computer system, said data representing a history of values for said at least one medically important variable for each of said patients;

receiving a request for data of one of said patients by a medical practitioner that is treating said one of said patients; and

outputting requested data for said one of said patients in the form of at least one of a chart and a graph to said medical practitioner,

said step of inputting comprising one of

transferring said raw data to a remote computer comprising an ordinary general purpose personal computer, then transferring said raw data to said primary computer;

telephoning an automatic telephone interface and employing one of speech recognition and touch-tone recognition software to input said raw data into said primary computer; and

telephoning a live receptionist. speaking the raw data to said live receptionist for entry into said primary computer,

said steps of receiving a request and outputting further include one of

connecting said remote computer to said primary computer using a connection that enables communication between said remote computer and said primary computer, entering said request into said remote computer, transmitting said request from said remote computer to said primary computer system, transmitting said requested data from said primary computer system to said remote computer in response to said request, said requested data representing at least one of said chart and graph and interpretable by said remote computer, said remote computer outputting said at least one chart and graph through output means and

calling a telephone interface using an ordinary voice telephone and a telephone network, transmitting said request for data from said telephone, receiving said request for data using said telephone interface, and passing said request for data to said primary computer system from said telephone interface, forming an image of said requested data in the form of an image of said at least one of a chart and graph and automatically transmitting said image by facsimile machine to said medical practitioner.

16. A system for improving and facilitating diagnosis and treatment of patients having medical conditions requiring long-term profiles of at least one predetermined medically important variable, comprising

means for measure said at least one predetenmined medically important variable;

means for inputting said at least one predetermined medically important variable as raw data into a primary computer comprising software and hardware enabling said primary computer system to operate as at least one of a web server, a dial-up host, a network server, and a telephone answering and data collection device whereby raw data can be communicated from a remote computer proximate a patient comprising an ordinary general purpose personal computer and from an ordinary telephone wherein data is transmitted as one of spoken data and touch-tone data;

software for coming said raw data as data for each patient, wherein said data for each patient represents a history of said at least one medically important variable,

means for receiving a request for data of one of said patients from a medical practitioner that is treating said one of said patients comprising software and hardware enabling said primary computer to operate as at least one of a web server, dial-up host, network server, and a telephone answering and data collection device wherein data is transmitted as one of spoken data and touch-tone data; and

means for automatically outputting requested data in response to receiving said request for data comprising means to transmit said requested data in the form of at least one of a chart and graph generated from said data from said primary computer to a remote computer proximate said practitioner whereby said primary computer is one of a web server, a dial-up host, and a network server and means to transmit said requested data by facsimile through a fax-modem integrated with said primary computer,

wherein said means for measuring and said means for inputting are operable independently from each other, such that, after obtaining a measurement, a patient may be separated from said means for measuring during an inputting operation by said means for imputing.

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